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IS 10943-2 (1984): Accommodation Ladders, Part 2: From 7 to 30 m Length [TED 17: Shipbuilding]

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IS : 10943 (Part 2) - 1984

Indian Standard

(Reaffirmed 2005)

SPECIFICATION FOR ACCOMMODATION LADDERS

PART 2 FROM 7 TO 30 m LENGTH

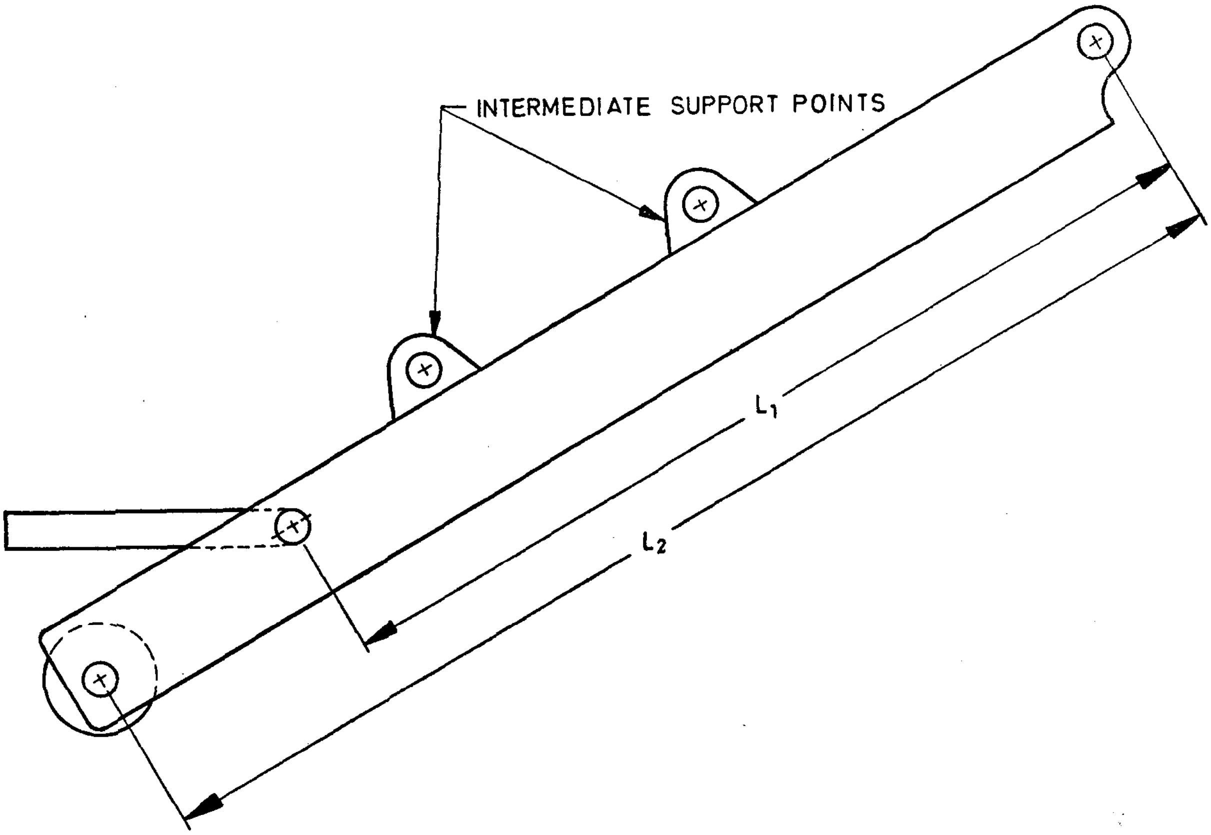
Shipbuilding Sectional Committee, MCPD 1 [Ref : Doc : MCPD 1 (579)]

1. Scope — Covers accommodation ladders from 7 to 30 m length used on merchant ships (excluding passenger ships) to enable persons to embark and disembark safely. The requirements are applicable to either single-flight or multi-flight ladders.

2. Terminology

2.1 *Nominal Length* L_1

2.1.1 For a single-flight ladder, the distance from the centre of the top pin to the centre of the lower platform holding pin (*see* Fig. 1).



Nominal length — L_1
Design length — L_2

FIG. 1 SINGLE FLIGHT LADDER

2.1.2 For a multi-flight ladder, the sum of the lengths L_3 and L_4 of the separate flights measured from the centre of the top pin to the centre of the lower pin in each case (*see* Fig. 2).

2.2 *Design Length* L_2 — The maximum distance between supporting points for each separate flight (*see* Fig. 1 and 2).

2.3 *Width W* — The minimum effective width of the walking surface between hand or guard rails (see Fig. 3).

2.4 *Handrail Height* — The vertical height of the upper surface of the handrail, measured from the highest point of the standing surface presented by the steps when the ladder is at its minimum angle of use (*see* Fig. 3).

3. Fixed Platform Ladder

3.1 The ladder is hinged from a fixed anchorage, and is capable of being varied in inclination between the ship and the lower access level.

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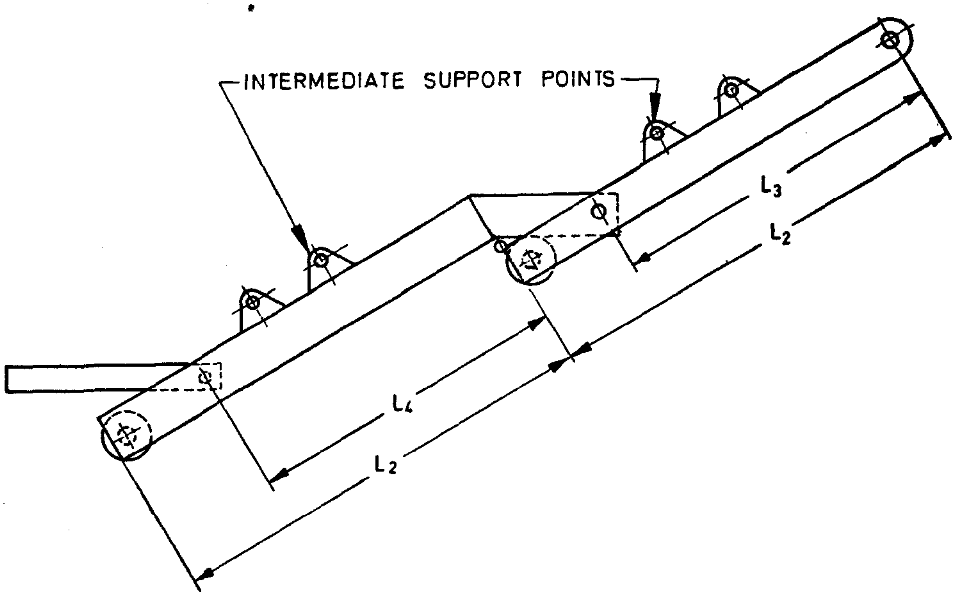

Nominal length — $L_1 = L_3 + L_4$
Design length — L_2 for each separate flight

FIG. 2 MULTI-FLIGHT LADDER

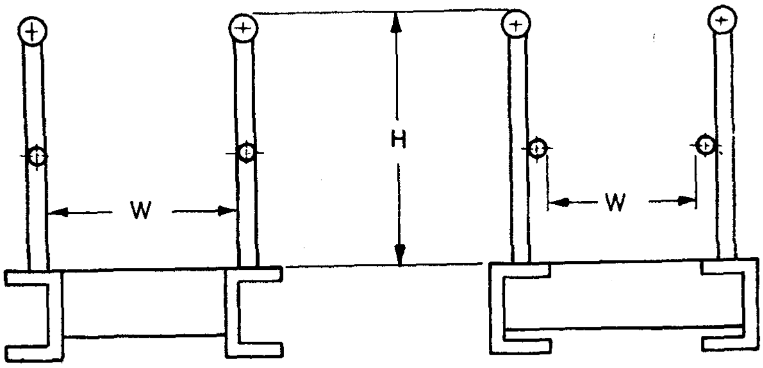

FIG. 3 MINIMUM WIDTH (*W*) AND HANDRAIL HEIGHT (*H*)

3.2 The ladder is supported by steel wire ropes or chains from suspension point(s) in the lower part of the ladder (*see* Fig. 1 and 2). This ladder may also be of single-flight or multi-flight construction.

4. Materials — The principal side members of the ladder shall be constructed from aluminium conforming to Grade 5300 of IS : 737 - 1974 'Span for wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) (*second revision*)'. Alternative materials may be used for these and other components provided that they are at least as suitable in all respects for the intended duty and are equally acceptable to the purchaser.

5. Dimensions

5.1 *Nominal Length* L^1 — Shall be:

a) 7·2 to 21·6 m in 1·2 m increments, and
b) 21·6 to 30·6 m in 1·8 m increments.

5.2 *Width W* — Shall be 750 mm for ladders of length greater than 7·2 m.

5.3 *Distance Between Steps* — The distance between the steps measured along the line tangential to the step noses shall be 300 mm.

5.4 *Top Handrail Height H* — Shall be not less than 1 000 mm. An intermediate rail at mid-height shall be provided (*see* Fig. 3).

5.4.1 A canvas or equivalent protection should be arranged from middle rail to bottom end for safety of children.

6. Design

6.1 *Minimum Angle of Use* — Ladders shall be designed for safe operation in a horizontal position.

6.2 *Maximum Angle of Use* — With the steps horizontal, the ladder shall operate safely at an angle of 55° from the horizontal.

6.3 *Design Loading* — The ladders shall be designed to support a uniform load equivalent to 735 N on every step when the ladder is in a horizontal position.

6.4 *Step Design* — Individual steps shall be designed to withstand a central point load of 735 N.

6.5 *Design Loading for Access and Intermediate Platforms* — The platforms shall be designed to support a uniform loading of 4 000 N/m^2. The framework and supporting structure of the upper and intermediate platforms shall in addition be designed to carry the weight of the suspended ladder together with the design load given in **6.3**.

6.6 *Design Loading for Handrail* — Handrails and supports shall be designed for a side loading at the upper handrail of 500 N/m without permanent deformation.

6.7 *Safety Factor* — The allowable stress used in the design of the ladder, with loading specified in **6.3**, shall be determined by applying a safety factor of 3 for aluminium.

7. Construction

7.1 The ladder is used ordinarily at an inclination up to 55 degrees against horizontal, its construction, however, shall be allowed to use also at the inclination of 65 degrees. The lower platform shall be constructed so as it can be fixed to suit angle of ladder used (*see* Fig. 5 and 6).

7.2 Contact surface of aluminium alloy and steel shall be painted and insulated properly to prevent electrolytic corrosion.

7.3 The handrail shall be of handy shape and size, and when a rope is used for a handrail, it shall be fibre rope of 22 mm outside diameter covered with plastics or nylon rope covered with PVC or aluminium wire rope.

7.4 The surface of step shall be of non-skid type achieved with half punching the steps or with welded strips or any other suitable methods.

8. Testing

8.1 *Procedure*

8.1.1 Each ladder shall be tested in a horizontal position, simply supported at the ends of the design length L_2 (*see* Fig. 4), to prove the longitudinal strength and to measure maximum deflection. In the case of multi-flight ladders, each separate flight shall be tested in a similar manner.

8.1.2 The ladder and platforms shall be uniformly loaded with a load equivalent to 735 N on every step.

8.2 *Measurement and Examination*

8.2.1 The maximum deflection of each flight of a ladder when loaded shall not exceed $L_2/300$.

8.2.2 After removal of the test load, the ladder, shall be carefully examined to ensure that there are no signs of failure of the structure and that no permanent deformation has taken place.

9. Designation — The ladder shall be designated by title and nominal length (m).

10. Marking — The following information shall be marked on readily visible place on the ladder body:

a) Nominal length,
b) Manufacturer's name or trade-mark, and
c) Date of manufacture and testing.

10.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

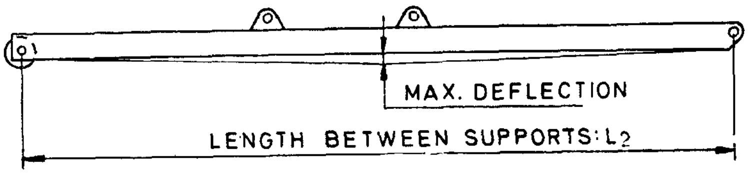

FIG. 4 METHOD OF TESTING FOR EACH SEPARATE FLIGHT

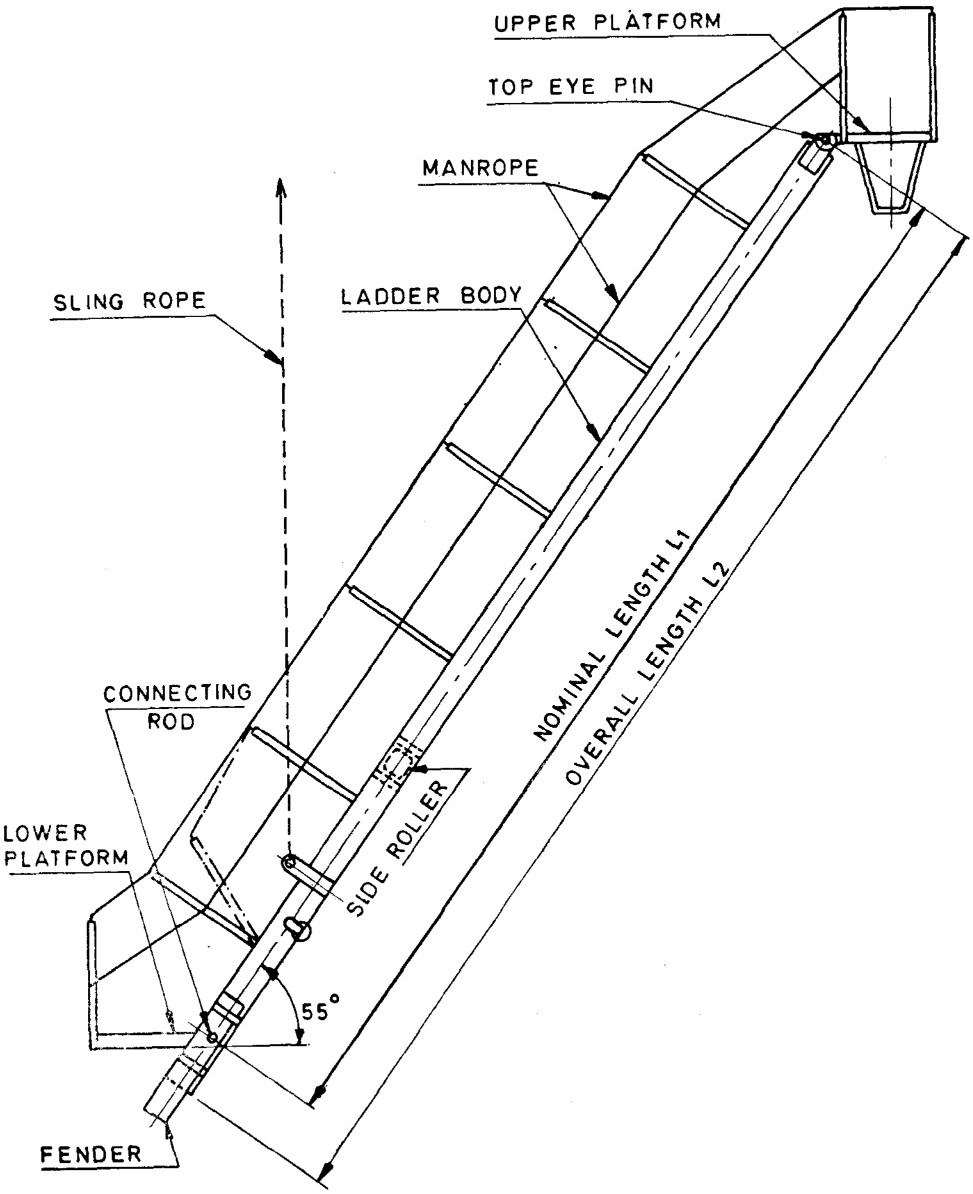

FIG. 5 ASSEMBLY PLAN